Patent claims

1. A supramolecular nanosystem which comprises at least one essentially nonhelical oligomer (oligomer A) and one or more, identical or different, essentially nonhelical and mutually nonpairing oligomers with identical or different functional units (oligomer B), wherein oligomer A can undergo specific noncovalent pairing with oligomer B, and oligomer B can be determined through its monomers.

2. A supramolecular nanosystem as claimed in claim 1, wherein oligomer A can form a hairpin loop.

3. A supramolecular nanosystem as claimed in claim 1, wherein the essentially nonhelical oligomer A and B is a pentopyranosyl-nucleic acid.

4. A supramolecular nanosystem as claimed in claim 3, wherein the pentopyranosyl-nucleic acid is selected from a group containing a ribo-, arabino-, lyxo- and/ xylo-pyranosyl-nucleic acid.

5. A supramolecular nanosystem as claimed in claim 3, wherein the pentopyranosyl part of the pentopyranosyl-nucleic acid has the D or L configuration.

6. A supramolecular nanosystem as claimed in claim 3, wherein the length of the nonhelical oligomer A is selected from a group consisting of 10, 100 and 500 monomer units.

7. A supramolecular nanosystem as claimed in claim 3, wherein the length of the nonhelical oligomer B is selected from a group consisting of 4, 8, 15, 25 and 50 monomer units.

8. A supramolecular nanosystem as claimed in claim 3, wherein the pentopyranosyl part of the pentopyranosyl-nucleic acid is present in a

form selected from a group containing a thiophosphate, alkylated phosphate, phosphonate and amide.

9. A supramolecular nanosystem as claimed in claim 3, wherein the nucleic acid contains a nucleobase.

10. A supramolecular nanosystem as claimed in claim 9 wherein the nucleobase is selected from a group containing adenosine, guanosine, isoguanosine, cytosine, isocytosine, thymidine, uracil, 2,6-diaminopurine and xanthine.

11. A supramolecular nanosystem as claimed in claim 3, wherein the nucleobase is replaced by a chelating agent.

12. A supramolecular nanosystem as claimed in claim 11, wherein the chelating agent is derived from a precursor compound.

13. A supramolecular nanosystem as claimed in claim 12 wherein the precursor compound is selected from a group containing pyrazolylpyridine and pyridoquinazoline.

14. A supramolecular nanosystem as claimed in any of claims 1, wherein the functional unit is selected from a group containing metal, a metal cluster, a semiconductor compound, a peptide, a redox center, a fluorescent label, a chelating agent and a conducting oligomer.

15. A supramolecular nanosystem as claimed in claim 14, wherein the metal is a noble metal.

16. A supramolecular nanosystem claimed in claim 15 wherein the noble metal is selected from a group containing gold, silver and platinum.

17. A supramolecular nanosystem as claimed in claim 14, wherein the semiconductor is selected from a group containing cadmium selenide and cadmium sulfide.

18. A supramolecular nanosystem as claimed in claim 14, wherein the fluorescent label is selected from a group containing a fluorophore and a chromophore.

19. A supramolecular nanosystem as claimed in claim 14, wherein the chelating agent is derived from a precursor compound.

20. A supramolecular nanosystem as claimed in claim 19 wherein the precursor compound is selected from a group containing anthocyans, polyoxycarboxylic acids, polyamines, dimethylglyoxime, ethylene-diaminetetraacetic acid and/or nitrilotriacetic acid.

21. A supramolecular nanosystem as claimed in claim 1, wherein oligomer A is linked to oligomer B.

22. A library comprising a plurality of different supramolecular nanosystems as claimed in claim 1.

23. A process for preparing a supramolecular nanosystem as claimed in claim 1 or a library as claimed in claim 22, which comprises specific noncovalent pairing of oligomer A with one or more identical or different oligomers B under suitable conditions.

24. The process as claimed in claim 23, wherein oligomer A is linked to oligomer(s) B in a further step.

25. A process for structural changing of the supramolecular nanosystem as claimed claim 1, which comprises changing the equilibrium conditions.

26. The process as claimed in claim 25, wherein the equilibrium conditions are changed by means selected form a group containing changing concentration of oligomer B, changing salt concentration, changing pH, changing pressure and changing temperature.

27. The use of a supramolecular nanosystem as claimed in claim 1 as electronic component; catalyst; semiconductor; photochemical unit; biocompatible material or unit or functional microprosthesis.

28. The use of a library as claimed in claim 22 for finding a metal catalyst.